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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/580,809

02/16/2007

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2060.7

6450

29494 7590 08/04/2008  
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EXAMINER

QIAN, YUN

ART UNIT

PAPER NUMBER

4162

MAIL DATE

DELIVERY MODE

08/04/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/580,809	<b>Applicant(s)</b> SAKAKIBARA ET AL.	
	<b>Examiner</b> YUN QIAN	<b>Art Unit</b> 4162	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 16 February 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/1/2006 and 7/31/2006</u> .                                  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 8, 10-12, 18 are rejected under 35 U.S.C.102 (b) as being anticipated by Glatkowski et al. (US 2003/0122111).

Regarding claim 1-3, 8, 10 and 18 Glatkowski '111 discloses an electrically conductive dispersion comprising of polymer (PVP) wrapped SWNTs, and NMP ([0047], [0048], [0049], [0088]). It may further comprise a surfactant ([0061]).

Regarding claim 11, Glatkowski discloses the nanotubes in the film are oriented and have an outer diameter of less than 3.5 nm (0.0035 um), which have the shorter wave of visible light so as not to absorb visible light, and to reduce scattering of the visible light (claim 35 and [0006]).

Regarding claim 12, Glatkowski discloses a method preparation of the film comprising steps of dispersing SWNTs in NMP solution, followed by sonication and filtration.

Art Unit: 1791

Claims 1-3, 6-9, 12-13, 15, and 17-18 are rejected under 35 U.S.C.102 (b) as being anticipated by Smalley et al. (US 2002/0046872).

Regarding claim 1-3, 8, and 18, Smalley '872 discloses a dielectric material dispersion comprising of polymer (PVP) wrapped SWNTs, and NMP ([0064] and [0076]). Optionally, the dispersion liquid may further comprise a surfactant ([0048]).

Regarding claims 6, 9, 12-13, 15 and 17, Smalley '872 discloses a method preparation of SWNTs dispersion liquid comprising of mixing nanotubes in 1% solution of NMP, followed by sonication, and filtered through a 1um polycarbonate filter to obtain the fine carbon nanotubes ([0064]).

Regarding claim 7, Smalley '872 discloses PVP used in the invention have a molecular weight 50 kD, which encompasses the instantly claimed (20,000 to 5,000,000).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1-5, 14, 16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glatkowski et al. (US 2003/0122111) in view of Zhang et al. (US 2005/0025694).

Art Unit: 1791

As discussed above, Glatkowski '111 discloses the invention of claims 1-3, and 18. Although Glatkowski '111 clearly points out the dispersions may further comprise additional materials, such as surfactant ([0061]). However, Glatkowski '111 fails to specially teach using a nonionic surfactant.

Zhang et al '694 discloses a method of preparing stable nanotubes dispersions liquid containing up to 30% of nonionic surfactant (nonylphenoxypoly-(ethyleneoxy) ethanol), which encompasses the instantly claimed 4-5 and 19 ([0036], [0077]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a nonionic surfactant of Zhang in the method of preparing an electrically conductive film taught by Glatkowski, because both teach a known method of preparing stable dispersions of SWNTs liquid and would have a reasonable expectation of success. Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

Regarding claims 14, 16 and 19, Glatkowski '111 discloses a method preparation of films by addition of the PVP coated SWNTs, which are generated by suspended SWNTs in surfactant and PVP, to the dispersant/NMP solution, followed by sonication, and then filtration as instantly claimed ([0131], [0088]).

Glatkowski '111 does not specially point out using a nonionic surfactant as the dispersant. Zhang et al discloses methods of preparing stable dispersions of nanotubes using nonionic surfactant nonylphenoxypoly-(ethyleneoxy) ethanol as instant claims 14 and 19. It would have been obvious to one of ordinary skill in

Art Unit: 1791

the art at the time the invention was made to use a nonionic surfactant of Zhang in the method of preparing an electrically conductive film taught by Glatkowski, because both teach a known method of preparing stable SWNTs dispersions liquid and would have a reasonable expectation of success.

Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

### **Conclusion**

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YUN QIAN whose telephone number is (571)270-5834. The examiner can normally be reached on Monday-Thursday, 10:00am -4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through

Art Unit: 1791

Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

YQ

August 1, 2008

/Melvin C. Mayes/  
Primary Examiner, Art Unit 1791